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in Fig. 7, plate 15, of which the side A B will be an *isometrical proportion* to the side *a b* of the square in Fig. 8. Produce the lines *c g, g e*, Fig. 7, as *g i g h*. Parallel to the side *e f*, Fig. 7, set off the distances *b* 10, *b* 20, *b* 30, *b* 40, taken from the line *b d*, Fig. 8, and from these points on the line *h i*, Fig. 7, draw lines to the point *g*, cutting the line *e f* as shown. A "scale of tangents" to 45° will thus be formed on the line *e f* of the cube. The divisions denoting the 5th, 15th, 25th, 35th angles on the line *b d*, Fig. 8, may also in like manner be transferred to *e f*, Fig. 7. These divisions may then be transferred to the other sides of the cubes, *a g, a b*, and so on, till all the sides are formed into scales of tangents, each of which may be applied two ways, or twenty-four ways in all. The square *a e f g*, Fig. 8, is a square equal in dimensions to that A *b c d* in Fig. 3, plate 15. The reader will at once see the applicability of these lines to the cutting of the cube in a great many directions. Figs. 8, 9, 11, and 13 will fully explain themselves, and indicate the way in which angular surfaces may be delineated.

The method by which circles are described isometrically now claims our attention. Let *a b c d*, Fig. 9, be the circle of which an isometrical projection is desired, and of which *e* is the centre. About this circle describe the square *f g h i*. Next project a cube, of which the side *a b*, Fig. 9, is in isometrical proportion to the line *h i*, Fig. 12. In the upper face of cube, *a b c h*, Fig. 12, draw the diagonals *a b c d*, cutting each other in the point *e*. Make *e f, e g* equal to the diameter *e c*, of the circle in Fig. 9. From *f* and *g* draw lines parallel to *a b c d*, cutting the sides *d a, a b, b c, c d*, in the points *n, l m*, and *k*. Eight points, *n, h, L, F, M, I, K*, and *G*, are thus obtained, through which, by hand, the ellipse or oval may be drawn. If the representation of a cylinder is required, the same process must be repeated in the lower side of cube *o p q c*, so as to obtain the part of the circle equal to the part *g k i m* and *f* of the upper circle ; the cylinder is completed by drawing the lines *f s g r* parallel to *b g d o*. Fig. 11 shows a circle projected in the left hand, and Fig. 10, in the right hand plane or side of a cube.

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Correspondence.

WE invite communications from our readers in matters connected with the trades we represent. Be brief, courteous, and to the point.

Editor of Wood-Worker :

I AM well pleased with the ILLUSTRATED WOOD-WORKER, and like the style of its "get up ;" the plates and typography are excellent, and, like the *American Builder*, shows the handiwork of good mechanics ; and the subject-matter is well selected and plainly treated, so that every one may understand, which is proof sufficient that there is a master-hand in the editorial department—one who knows the wants and tastes of the wood-workers in general.

The papers on "Practical Carpentry" are quite scientific and good. I hope they may be continued to the end. It is just what all carpenters need, old or young, who have any ambition to become master mechanics or useful in their profession.

I would like to make a few suggestions.

To be brief : First, then, I think there should be a scale of feet and inches accompanying each plate, elevation, plan, or other drawing. A plan or elevation may look well on paper and please the eye, yet a mechanic undertaking to execute the plan may get the book-case, or house, or whatever it may be, badly out of proportion, in the absence of any scale to work by. Industrious and ambitious apprentices and young mechanics are often found building book-cases, wardrobes, tool-chests, and miniature houses, etc., during the winter, or other slack times, and I may say the "old mechanic" as well.

Secondly. On page 5, plate 3, ILLUSTRATED WOOD-WORKER, I find the ground plan of the writing-table exactly reversed to what I think it should be. The *front* of the *ground plan* is lying to the front of the writing-table, and is best understood by turning the book upside down, then the writing-table is also upside down, which causes a confusion of ideas.

I have noticed the same thing in the elevations and plans of houses. Now, I think, where the front elevation with the ground plan are given, to be plainly seen and fully understood the elevation should be first on the page or drawing, directly opposite the beholder, then the ground plan below or between the person viewing it and the elevation, and the front of the ground plan next to said person, as then there would not be any confusion, caused by the frequent reversing of the drawing, to thoroughly and intelligently read the plans, etc.

I know there are times and cases where this cannot be done, on account of room or position of building.

By placing the drawings in the position suggested, many of your readers will be benefited, and much trouble and bewilderment will be avoided. J. A. K.

PETALUMA, CAL., Feb. 3, 1879.

Editor of the Illustrated Wood-Worker :

I FORWARD you a few drawings which I think may be of service to some of your young readers. Figs. 2 and 3, plate 23, show easy methods of constructing octagons. Lay the steel square across and even with the edges of a board, and by pricking off seven inches from each end of the square, as shown, you have the points for the angles of an octagon figure. Fig. 4 shows an easy way to square a foundation, fence, or piece of land. Set a stake, 1; then set stake 2, exactly eight feet from stake 1, and in proper line; then measure down the other side six feet from stake 1, then the line across the angle will be exactly ten feet, if the two boundary lines are at right angles. If the diagonal line is more or less than ten feet, No. 3 stake must be moved until the distance between the stakes 2 and 3 is just ten feet distance from each other, always keeping No. 3 stake exactly six feet from stake No. 1.

Fig. 5 shows a method for obtaining the length and bevel of hip and jack rafters. B shows the down cut for the common rafter, C the plumb cut of the hip, D the side cut of the jack rafters, E the butt cut of the hip, F the length of jack rafters; A is the common rafter, and G is the butt cut of same.

The Wood-Worker is just the thing we want, plain and full of practical matter.

How about that new steel square?

Ambrose Rettefer.

Little Rock, Ark., Feb. 1, 1879.

Editor of the Wood-Worker:

A. P. G., in question No. 4, of the Illustrated Wood-Worker, wants to know the name of the firm manufacturing the best combination planes, and some one signing himself "Hard Case"—which, by the way is a very appropriate name for him—says that the Stanley Rule and Level Company make the best C. planes, and he also says that "the best are scarcely worth chest room; when you go to buy, don't!" "Hard Case" is either no mechanic, or never saw one of Bailey's combination matching planes, plough and fillister. My answer to A. P. G. is, that I have used one of Bailey's planes for six years, and instead of it not being worth chest room, I would build an extra chest for it rather than be without it. Now, A. P. G., when you go to buy a Bailey C. plane, do!

J. L. Long.

Freeport, Pa., Feb. 17, 1879.

Editor of the Illustrated Wood-Worker:

I send you a method of obtaining the bevels, cuts, and lengths required in constructing a hip roof. The method is similar to the one used for obtaining hopper cuts. The bevel T N, Fig. 1, plate 23, is the side cut; X E is the down cut. It must be understood that the roof as shown is built with principal rafters. On the same Fig. is also shown the method of obtaining the length and bevels of the jack or minor rafters. The bevel S is for the edge of jack, bevel L is the down cut. You will observe how I produce bevel S by running a line parallel with plate from point of jack, also from short side of bevel, then square out a line from back of common rafter, then take thickness of jack and set out on square line, then, where joints of jacks intersect, draw a line to mark on square line, and in the angle is seen the bevel for edge of jack. The other parts of the drawing will be easily understood.

Alonzo says his method for getting hip rafters may be old; well, yes, but it is good notwithstanding. James W. Grant.

St. Catherine's, Ont.

To the Editor of the Wood-Worker:

Permit me to make the following suggestions regarding the Wood-Worker, which I know will be acceptable to many of the younger mechanics who take your valuable paper. First, I would like you to give some mathematical rules in connection with your excellent papers on "Practical Carpentry." I would also like to see the different tools used by carpenters and joiners taken up, and their care and uses discussed. I would also like to see some papers on the construction of the carcase of stairs. The country is full of works on hand-railing, but there is very little said concerning the stairs themselves, and many young fellows, like myself, would like a few lessons on stair-building before it would be in order to tackle a hand-rail.

Wm. A. G.

To the Editor of the Illustrated Wood-Worker:

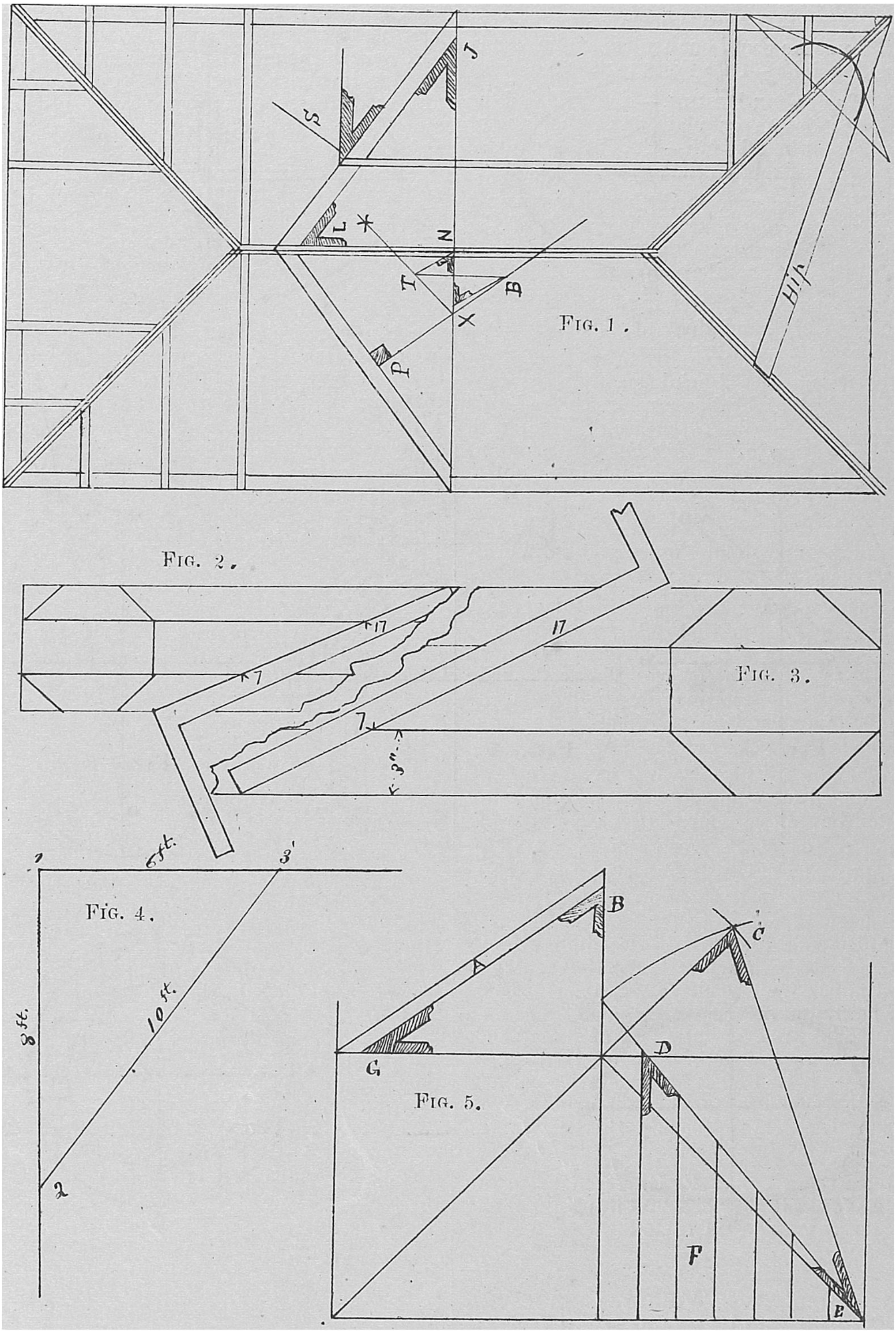
I am very much pleased with the Wood-Worker; it is just what the workmen require. I think, however, it would be an improvement if your artist would not use so much shading in his designs, as I find it somewhat difficult to make out the different parts of the designs, on account of their being buried in the shadow of the background. This is merely a suggestion, however, and I may be the only one of your many readers who may find any trouble on this account. J. N. S.

New London, Conn., Feb. 13, 1879.

High Speed in Woodworking.

A manufacturer of camp furniture in Birmingham has devised a special plan for this branch of wood-working, and the various machines used work at a speed far beyond any thing hitherto achieved, as an instance of which may be quoted the machine used for planing the wood. The wood passes through this machine at the rate of 1500 feet per minute, and on a recent occasion the accidental acceleration of the engine brought the speed of traverse up to 2000 feet per minute, at which the machine did its work as well as at the ordinary speed. The surface of the wood is as smooth as if done with a good hand-plane.

PLATE 23.



HIP RAFTERS AND CARPENTRY.